WESTON SOLUTIONS
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MEMORANDUM

TO: Chrome Engineering Site File

cc: Allen Jarrell, U.S. Environmental Protection Agency, On-Scene Coordinator

FROM: Mark Hall, Weston Solutions, Inc., Superfund Technical Assessment and Response Team

DATE: 7 October 2009

RE: Soil Sample Collection Activities at the Chrome Engineering Site.
TDD No. 09-04-0011; Task No. 0542; Document Control No. R-5624.

Site Location

The Chrome Engineering Site (the site) is located at 405 Central Avenue, Bridgeport, Fairfield County, Connecticut (CT). The geographic coordinates of the property, as measured from its approximate center, are 41° 10′ 21″ north latitude and 73° 09′ 59″ west longitude (see Attachment A, Figure 1) [1]. The 1.25-acre site is located in a residential/commercial/industrial area and is bordered to the north by Eagle Street; to the east by Central Avenue and Johnson's Creek/Cove; to the south by Trowel Street; and to the west by industrial property (see Attachment B, Figure 2) [2].

Site Background

The site was developed for use as a plating facility during the 1950s. Plating operations occurred at the site from the 1950s until the mid-1960s. The on-site building was expanded in 1968 and again in 1977. Between 1984 and 1993, Connecticut Department of Environmental Protection (CT DEP) conducted numerous inspections of the property and documented environmental violations [3].

In the early 1990s, a Phase I assessment was conducted at the site, and cyanide was detected in soils beneath the building foundation at up 625 parts per million (ppm). A closure plan was negotiated with CT DEP; however, the facility was abandoned in 1996 prior to completion of closure activities [3].

In February 1997, a fire occurred at the facility, and large quantities of hazardous materials were noted during the response. In 1997, U.S. Environmental Protection Agency (EPA) and Roy F. Weston (now known as Weston Solutions, Inc.) Superfund Technical Assessment and Response Team (START) conducted a removal action to characterize and remove the waste materials. The

site was placed into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) (CTD001167923) [3].

In 2002, a pre-demolition asbestos survey and waste inventory were conducted for the City of Bridgeport. Analytical results indicated the presence of asbestos, arsenic, cadmium, chromium, hexavalent chromium, and lead [3].

In March 2003, EPA/START conducted a Removal Preliminary Assessment/Site Investigation (PA/SI). Analytical results indicated the presence of semivolatile organic compounds (SVOCs), chromium, lead, nickel, and asbestos. From October 2003 to January 2004, EPA/START conducted a second removal action at the site. Removal activities included staging, characterization, and transportation and disposal (T&D) of containers and hazardous materials; removal of asbestos from the on-site building; extent-of-contamination soil sampling; excavation and T&D of contaminated soils; and backfilling of soil excavations [3].

Between 2004 and 2006, the on-site building was demolished; and a Phase III Environmental Site Investigation (2004) and post-demolition soil sampling (2006) were conducted at the site. The Phase III identified an area of concern for potential re-development of the property: sampling results indicated the presence of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and metals in soil; and VOCs and metals (arsenic, copper, lead, selenium, and zinc) in groundwater. In 2007 and 2008, a Phase II Environmental Site Assessment Report and an Interim Remedial Action Plan were submitted to CT DEP, respectively [4].

The site is currently vacant and owned by the City of Bridgeport. Redevelopment plans under the EPA Brownfields Program are in negotiation and pending based on limited available funding.

Site Activities

22 June 2009 (Monday)

On 22 June 2009, EPA On-Scene Coordinator Allen Jarrell and START members Mark Hall and Gerry Hornok mobilized to the site to collect soil samples from an on-site soil pile. START member Hall conducted a safety and operations meeting, and on-site personnel reviewed and signed the site Health and Safety Plan (HASP). The HASP was prepared as a separate document, entitled *Weston Solutions, Inc., Region I START Site Health and Safety Plan (HASP) for the Chrome Engineering Site, Bridgeport, Connecticut,* dated June 2009 [5]. START personnel established a support zone and calibrated the air monitoring instrument, a combustible gas indicator/oxygen meter (CGI/O_2) [6, 7]. Background levels were recorded in the HASP as follows: photoionization detector (PID) = 0.0 parts per million (ppm); lower explosive limit (LEL) = 0%; and oxygen (O_2) = 20.9%. Sampling activities were performed in accordance with the site sampling and analysis plan (SAP), which was prepared as a separate document, entitled *Sampling and Analysis Plan for the Chrome Engineering Site, Bridgeport, Fairfield County, Connecticut* [8].

Using dedicated equipment, START personnel collected composite surface soil samples from the on-site soil pile [9]. Air monitoring conducted at each sample location indicated no readings above background levels.

START collected a total of six composite surface soil samples (SP-01 through SP-06, including field duplicate SP-06) from the soil pile. All samples were sent to EPA Office of Environmental Measurement and Evaluation (OEME), located in North Chelmsford, Massachusetts, for Toxicity Characteristic Leaching Procedure (TCLP) metals analyses (see Attachment C, Chain-of-Custody Record).

On 3 August 2009, START received the analytical data results from OEME [10]. These data are summarized in Attachment D, Table 1. Complete laboratory data results may be found in Attachment E.

Analytical Data Summaries

Metals Results

Four metals were detected in soil samples and include the following (with maximum concentration and sample number in parentheses): barium [1,870 micrograms per liter (µg/L) in SP-01]; cadmium (4,520 µg/L in SP-04); chromium (859 µg/L in SP-01); and lead (1,550 µg/L in SP-06). Cadmium, chromium, and lead were detected in one or more of the soil samples at concentrations exceeding CT DEP Pollutant Mobility Criteria (PMC).

REFERENCES

[1] USGS (U.S. Geological Survey). 1970 (Photorevised 1984). Bridgeport, Connecticut (7.5-minute series topographic map).

[2] Google Earth. 2006. Digital Orthophoto Imagery. Available from Google Earth and accessed 17 June 2009.

[3] Weston Solutions, Inc. February 2004. *Removal Program After Action Report for the Chrome Engineering Site, Bridgeport, Fairfield County, Connecticut, 14 October 2003 through 12 January 2004.* Superfund Technical Assessment and Response Team (START), Wilmington, MA.

[4] Metcalf & Eddy, Inc. April 2008. *Interim Remedial Action Plan, Former Chrome Engineering Property, 405 Central Avenue, Bridgeport, Connecticut.* Wallingford, CT.

[5] Weston Solutions, Inc., June 2009. *EPA Region I START Site Health and Safety Plan (HASP) for the Chrome Engineering Site, Bridgeport, Connecticut.* Superfund Technical Assessment and Response Team III (START), Wilmington, MA.

[6] Weston Solutions, Inc. March 2006. *Standard Operating Procedure for Thermo Environmental Instruments Flame Ionization Detector/Photoionization Detector Model TVA-1000B, Toxic Vapor Analyzer,* SOP No. WSI/S3-023, Superfund Technical Assessment and Response Team III (START), Wilmington, MA.

[7] Weston Solutions, Inc. March 2006. *Standard Operating Procedure for Ludlum Model 19 Micro R Meter,* SOP No. WSI/S3-022, Superfund Technical Assessment and Response Team III (START), Wilmington, MA.

[8] Weston Solutions, Inc. June 2009. *Sampling and Analysis Plan for the Chrome Engineering Site, Bridgeport, Fairfield County, Connecticut.* Superfund Technical Assessment and Response Team III (START), Wilmington, MA.

[9] Weston Solutions, Inc. July 2005. *Standard Operating Procedure for Surface and Subsurface Soil Sampling,* SOP No. WSI/S3-001, Superfund Technical Assessment and Response Team III (START), Wilmington, MA.

[10] U.S. Environmental Protection Agency. 27 July 2009. Office of Environmental Measurement and Evaluation. Laboratory Report. Project No. 09060031. Chrome Engineering, Bridgeport, CT. TCLP Metals by ICP.

Attachment A

Figure 1 - Site Location Map

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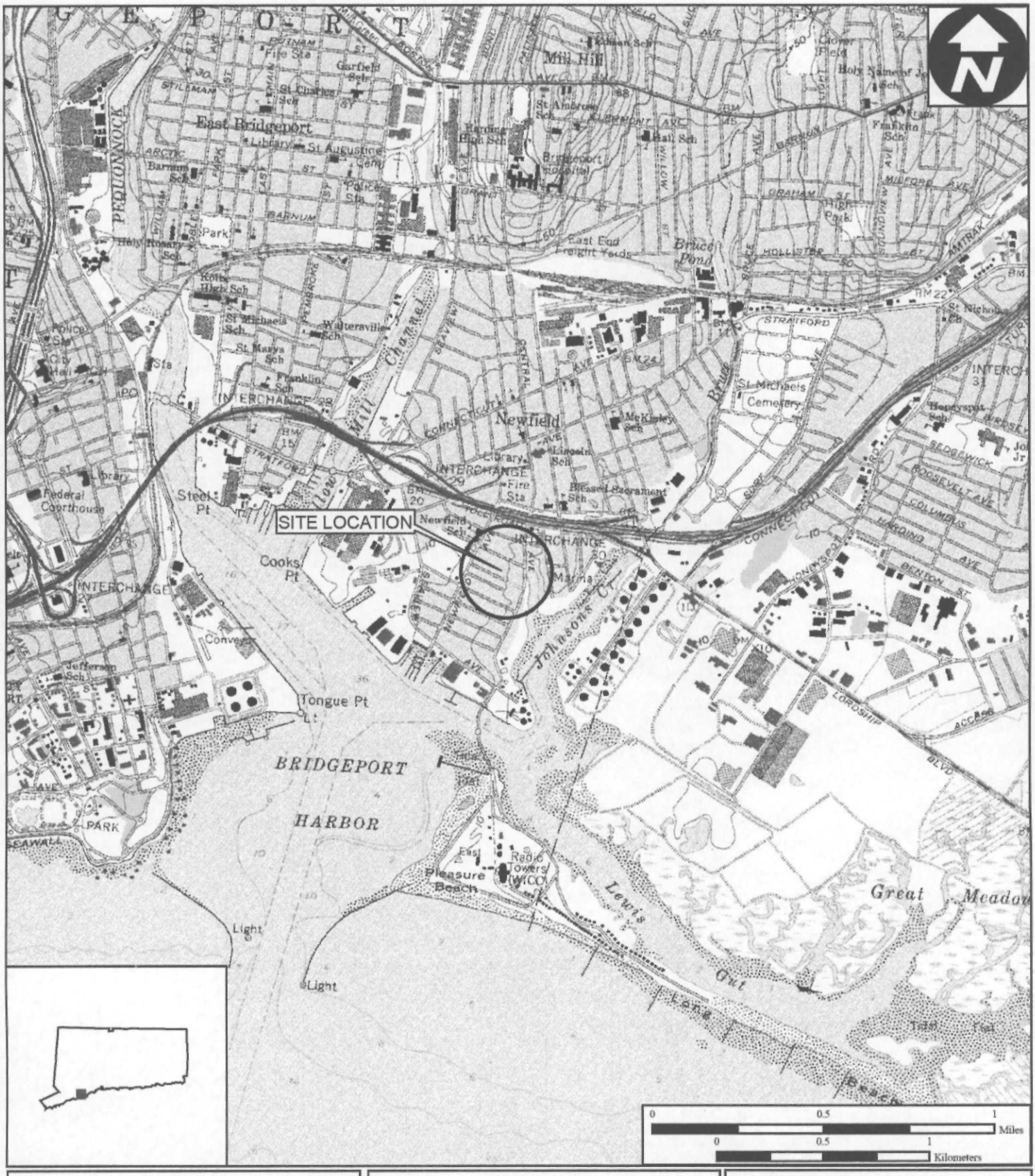

Figure 1

Site Location Map

Chrome Engineering Site
405 Central Avenue
Bridgeport, Connecticut

EPA Region I
Superfund Technical Assessment and Response Team (START) III
Contract No. EP-W-05-042

TDD Number:	09-04-0011
Created by:	Bonnie Mace
Created on:	23 September 2009
Modified by:	
Modified on:	

Data Sources:
Topos: MicroPath/USGS
Quadrangle Name(s): Bridgeport, CT
All other data: START

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Attachment B

Figure 2 - Site and Sample Location Map

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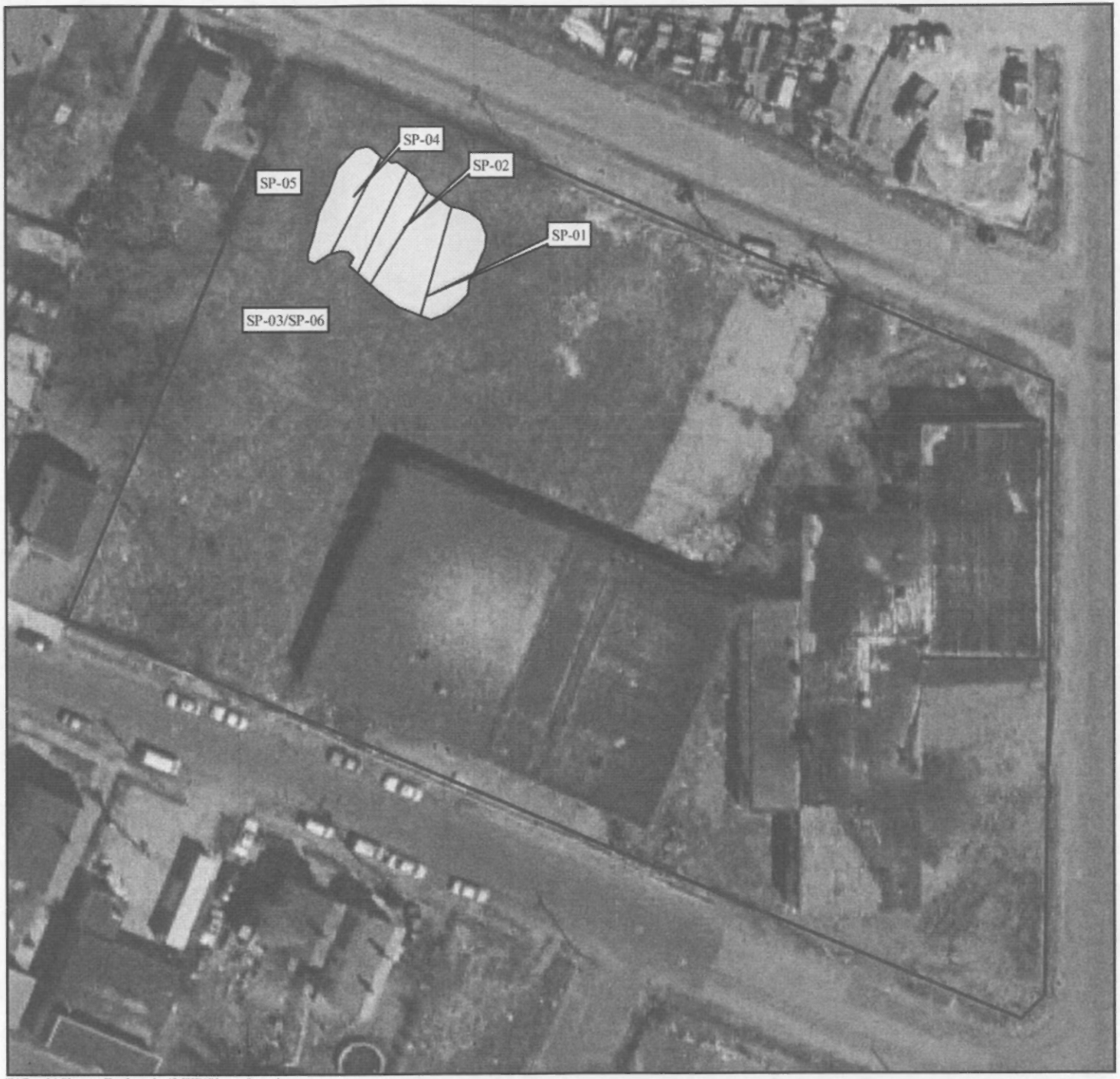

Figure 2

Site and Sample Location Map

Chrome Engineering
405 Central Ave.
Bridgeport, Connecticut

EPA Region I
Superfund Technical Assessment and Response Team (START) III
Contract No. EP-W-05-042

TDD Number:	09-04-0011
Created by:	G. Homok
Created on:	23 September 2009
Modified by:	
Modified on:	

LEGEND

- Site Boundary
- Soil Pile
- Pile Divisions

N

0 50 100 Feet

Data Sources:

Imagery: University of Connecticut (UCONN) Center for Land Use Education (CLEAR) and Research (CLEAR)
Topos: MicroPath
All other data: START

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Attachment C

Chain-of-Custody Record

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PN: 090600 31

Chrome Engineering

CHAIN OF CUSTODY RECORD

Site #: R01-062209AJ

No: R01-062209AJ-06/22/09-0001

Lab: US EPA OEME

Lab #	Sample #	Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	MS/MSD
	R01-062209AJ-0001	SP-01	RCRA Metals - TCLP	Soil	6/22/2009	10:45	2	8 oz jar	4 C	Y
	R01-062209AJ-0002	SP-02	RCRA Metals - TCLP	Soil	6/22/2009	10:55	2	8 oz jar	4 C	N
	R01-062209AJ-0003	SP-03	RCRA Metals - TCLP	Soil	6/22/2009	11:05	2	8 oz jar	4 C	N
	R01-062209AJ-0004	SP-04	RCRA Metals - TCLP	Soil	6/22/2009	11:15	2	8 oz jar	4 C	N
	R01-062209AJ-0005	SP-05	RCRA Metals - TCLP	Soil	6/22/2009	11:25	2	8 oz jar	4 C	N
	R01-062209AJ-0006	SP-06	RCRA Metals - TCLP	Soil	6/22/2009	11:05	2	8 oz jar	4 C	N

Special Instructions: Please email the results to OSC Allan Jarrell at jarrell.allan@epa.gov.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
SAMPLE TRANSFER	[signature]	6/22/09	[signature] ESAT	6/22/09	16:25						

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Attachment D

Table 1 - TCLP Metals in Soil

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TABLE 1

SUMMARY OF TOXICITY CHARACTERISTIC LEACHING PROCEDURE METALS RESULTS
SURFACE SOIL SAMPLES
CHROME ENGINEERING SITE
BRIDGEPORT, CONNECTICUT

SAMPLE LOCATION SAMPLE NUMBER LABORATORY SAMPLE NUMBER	SP-01 R01-062209AJ-0001 AA95533	SP-02 R01-062209AJ-0002 AA95534	SP-03 R01-062209AJ-0003 AA95535	SP-04 R01-062209AJ-0004 AA95536	SP-05 R01-062209AJ-0005 AA95537	SP-06 R01-062209AJ-0006 AA95538	CT DEP PMC for GB Areas (µg/L)
PARAMETER							
Arsenic	ND	ND	ND	ND	ND	ND	**500**
Barium	1,870	1,400	1,390	1,030	676	1,560	**10,000**
Cadmium	**454**	**1,870**	**2,520**	**4,520**	**2,070**	**2,890**	**50**
Chromium	**859**	301	**555**	231	ND	330	**500**
Lead	ND	ND	ND	ND	**280**	**1,550**	**150**
Selenium	ND	ND	ND	ND	ND	ND	**500**
Silver	ND	ND	ND	ND	ND	ND	**360**

NOTES:

1) Samples analyzed by U.S. EPA Office of Environmental Measurement and Evaluation (OEME) using EPA Region I SOP, EIASOP-INGDVICP1, TCLP Metals by Inductively Coupled Plasma (ICP).
2) All Results in micrograms per Liter (µg/L).
3) CT DEP PMC = Connecticut Department of Environmental Protection Pollutant Mobility Criteria for Soil, GB Areas.
4) Bolded and shaded results exceed CT DEP PMC for GB Areas.
5) ND = Not Detected.

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Attachment E

Analytical Data

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 27, 2009

Allen Jarrell - HBR
US EPA New England, Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 09060031
Project: Chrome Engineering - Bridgeport, CT
Analysis: TCLP Metals by ICP
Analyst: Michael Dowling
MD 7/28/09

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Samples were analyzed following the EPA Region 1 SOP, EIA-INGDVICP1.SOP.

Samples were prepared following the EPA Region 1 SOP, EIA-INGTCLP2.SOP and EIA-INGMETALSPREP6.SOP.

Samples were analyzed by inductively coupled plasma spectrometry. Preparation and analysis SOP's are based on Methods 1311, 3010A and 6010B as stated in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd ed., Rev. 0,1 and 2, Final Update I, 7/92 and III, 12/96."

Samples were prepared and analyzed by ESAT contractors working at the USEPA New England Laboratory.

Date Samples Received by the Laboratory: 06/22/2009

Data were reviewed in accordance with the internal verification procedures described in the EPA New England OEME Chemistry QA Plan.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Report may contain multiple sections and each section will be numbered independently.

If you have any questions please call me at 617-918-8340

Sincerely,

Daniel N. Boudreau 7/28/09
Daniel N. Boudreau
Chemistry Team Leader

Laboratory Qualifiers:

RL	Reporting limit
ND	Not Detected above reporting limit
NA	Not Applicable
NC	Not calculated since analyte concentration is ND
J1	Estimated value due to MS recovery outside accceptance criteria
J2	Estimated value due to LFB result outside acceptance criteria
J3	Estimated value due to RPD result outside acceptance criteria
J4	Estimated value due to LCS result outside acceptance criteria
B	Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R	No recovery was calculated since the analyte concentration is greater than four times the spike level.

Comments:

The laboratory reagent blank results for all analytes were nondetect (ND).

A Laboratory Control Sample (see below) was analyzed.

TCLP Metals in Soil Laboratory Control Sample
ERA Lot# D062-544 Catalog No. 544

Analyte	Result (ug/L)	Certified Value (ug/L)	Acceptance Limits (ug/L)
Arsenic	5350	5180	3830 - 6520
Barium	2590	2520	1760 - 3270
Cadmium	2430	2320	1830 - 2810
Chromium	13600	13000	9550 - 16500
Lead	1140	1050	579 - 1530
Selenium	6870	6690	4950 - 8430
Silver	11200	7880	4900 - 10800

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Chrome Engineering - Bridgeport, CT

TCLP Metals by ICP

Client Sample ID:	R01-062209AJ-0001	Lab Sample ID:	AA95533
Date of Collection:	6/22/2009	Matrix	Soil
Date of Digestion:	7/10/2009	Final Volume:	50 mL
Date of Analysis:	07/21/2009	Digestate Dilution:	10
Volume Digested:	50 mL	pH:	N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	**1870**	200	
7440-43-9	Cadmium	**454**	100	
7440-47-3	Chromium	**859**	200	
7439-92-1	Lead	ND	200	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	100	J4

Comments:

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Chrome Engineering - Bridgeport, CT

TCLP Metals by ICP

Client Sample ID:	R01-062209AJ-0002	Lab Sample ID:	AA95534
Date of Collection:	6/22/2009	Matrix	Soil
Date of Digestion:	7/10/2009	Final Volume:	50 mL
Date of Analysis:	07/21/2009	Digestate Dilution:	10
Volume Digested:	50 mL	pH:	N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	**1400**	200	
7440-43-9	Cadmium	**1870**	100	
7440-47-3	Chromium	**301**	200	
7439-92-1	Lead	ND	200	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	100	J4

Comments:

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Chrome Engineering - Bridgeport, CT

TCLP Metals by ICP

Client Sample ID:	R01-062209AJ-0003	Lab Sample ID:	AA95535
Date of Collection:	6/22/2009	Matrix	Soil
Date of Digestion:	7/10/2009	Final Volume:	50 mL
Date of Analysis:	07/21/2009	Digestate Dilution:	10
Volume Digested:	50 mL	pH:	N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	**1390**	200	
7440-43-9	Cadmium	**2520**	100	
7440-47-3	Chromium	**555**	200	
7439-92-1	Lead	ND	200	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	100	J4

Comments:

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Chrome Engineering - Bridgeport, CT

TCLP Metals by ICP

Client Sample ID:	R01-062209AJ-0004	Lab Sample ID:	AA95536
Date of Collection:	6/22/2009	Matrix	Soil
Date of Digestion:	7/10/2009	Final Volume:	50 mL
Date of Analysis:	07/21/2009	Digestate Dilution:	10
Volume Digested:	50 mL	pH:	N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	**1030**	200	
7440-43-9	Cadmium	**4520**	100	
7440-47-3	Chromium	**231**	200	
7439-92-1	Lead	ND	200	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	100	J4

Comments:

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Chrome Engineering - Bridgeport, CT

TCLP Metals by ICP

Client Sample ID:	R01-062209AJ-0005	Lab Sample ID:	AA95537
Date of Collection:	6/22/2009	Matrix	Soil
Date of Digestion:	7/10/2009	Final Volume:	50 mL
Date of Analysis:	07/21/2009	Digestate Dilution:	10
Volume Digested:	50 mL	pH:	N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	**676**	200	
7440-43-9	Cadmium	**2070**	100	
7440-47-3	Chromium	ND	200	
7439-92-1	Lead	**280**	200	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	100	J4

Comments:

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Chrome Engineering - Bridgeport, CT

TCLP Metals by ICP

Client Sample ID:	R01-062209AJ-0006	Lab Sample ID:	AA95538
Date of Collection:	6/22/2009	Matrix	Soil
Date of Digestion:	7/10/2009	Final Volume:	50 mL
Date of Analysis:	07/21/2009	Digestate Dilution:	10
Volume Digested:	50 mL	pH:	N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	**1560**	200	
7440-43-9	Cadmium	**2890**	100	
7440-47-3	Chromium	**330**	200	
7439-92-1	Lead	**1550**	200	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	100	J4

Comments:

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Chrome Engineering - Bridgeport, CT

Extraction Blank for TCLP Metals by ICP

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Water
Date of Digestion:	7/10/2009	Final Volume:	50 mL
Date of Analysis:	07/21/2009	Digestate Dilution:	10
Volume Digested:	50 mL	pH:	N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	ND	200	
7440-43-9	Cadmium	ND	100	
7440-47-3	Chromium	ND	200	
7439-92-1	Lead	ND	200	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	100	

Comments: Extraction Fluid #1

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METALS MATRIX SPIKE (MS) RESULTS

Sample ID: AA95534

PARAMETER	SPIKE ADDED ug/L	SAMPLE CONCENTRATION ug/L	MS CONCENTRATION ug/L	MS % REC	QC LIMITS (% REC)
Arsenic	5000	ND	4500	90	75 - 125
Barium	100000	1400	87700	86	75 - 125
Cadmium	1000	1870	2730	86	75 - 125
Chromium	5000	301	4990	94	75 - 125
Lead	5000	ND	4640	93	75 - 125
Selenium	1000	ND	955	96	75 - 125
Silver	5000	ND	4100	82	75 - 125

Comments:

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Laboratory Duplicate Results

Sample ID: AA95533

PARAMETER	SAMPLE RESULT ug/L	SAMPLE DUPLICATE RESULT ug/L	PRECISION RPD %	QC LIMITS
Arsenic	ND	ND	NC	30
Barium	1870	1880	1	30
Cadmium	454	450	1	30
Chromium	859	874	2	30
Lead	ND	ND	NC	30
Selenium	ND	ND	NC	30
Silver	ND	ND	NC	30

Comments:

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	5000	4860	97	85 - 115
Barium	100000	99000	99	85 - 115
Cadmium	1000	1020	102	85 - 115
Chromium	5000	5200	104	85 - 115
Lead	5000	5200	104	85 - 115
Selenium	1000	1020	102	85 - 115
Silver	5000	5290	106	85 - 115

Comments:

Samples in Batch: AA95533, AA95534, AA95535, AA95536, AA95537, AA95538